

MULTIPLE HERBICIDE RESISTANCE IN COMMON RAGWEED. Jeff M. Stachler and Mark M. Loux, Extension Program Specialist and Professor, Department of Horticulture and Crop Science, The Ohio State University, Columbus, OH 43210.

Field research was conducted in Ohio in 2007 to characterize the response of two common ragweed populations from Clinton County, Ohio to POST application of PPO inhibitors, ALS inhibitors, and glyphosate. The response of individual plants and overall control were measured 21 DAT and in September. At the site where resistance to PPO and ALS inhibitors was suspected, application of up to twice the recommended rate of ALS inhibitors (chlorimuron-ethyl, cloransulam-methyl, and imazamox) controlled less than 25% of the common ragweed 21 DAT. Control with PPO inhibitors (fomesafen and lactofen) did not exceed 40% at 21 DAT or in September. A mixture of cloransulam plus fomesafen did not improve control, compared with application of either alone. Nearly all of the individual plants that were marked prior to application survived treatment with ALS inhibitors into September, and 87 to 100% survived application of PPO inhibitors or a mixture of cloransulam and fomesafen. Glyphosate applied at 0.84 kg ae/ha controlled 96% of this population. Results from a related study involving combinations of PRE and POST herbicides showed that it was not possible to obtain adequate control of this population without the use of POST glyphosate treatments.

At the site where resistance to glyphosate and ALS inhibitors was suspected, POST application of glyphosate resulted in less than 35% control 21 DAT, and less than 20% control in September. A second application of glyphosate, 21 days after the first, improved late-season control by less than 20%. Cloransulam failed to provide any control, and mixtures of cloransulam and glyphosate controlled only 25 to 35% of the common ragweed in September. Survival of individual plants ranged from 80 to 93% at the end of the season for cloransulam and glyphosate treatments. Fomesafen (0.35 kg/ha) applied with methylated seed oil and ammonium sulfate controlled only 59% of the common ragweed at the end of the season, but this improved to 98% when followed with a POST application of glyphosate three weeks later. The combination of fomesafen, glyphosate (1.7 kg/ha), and ammonium sulfate (no methylated seed oil) controlled 50% of the common ragweed, and this improved to 90% when followed with a POST glyphosate application. Lactofen-containing treatments did not result in more than 60% control at the end of the season, regardless of whether methylated seed oil was used or glyphosate was applied later.

These studies confirmed the presence in Ohio of common ragweed biotypes with multiple herbicide resistance, to PPO and ALS inhibitors, or glyphosate and ALS inhibitors. Results indicated that glyphosate can still have activity on small glyphosate-resistant plants that have been partially controlled by a previous application of a non-glyphosate herbicide, but that the activity of the previous herbicide should be optimized for most effective control (i.e. use of methylated seed oil with fomesafen).